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cians in a degree; it remains for us, therefore, before we give it up, to attempt to take it by sap.

If the interior be really a waterless desert, I would say that it is probably still perfectly traversable. Observation has led me to the strong conviction that the surface-waterless-tertiary deserts of Australia abound with sub-surface water. I should expect to find it at depths in general of not more than 120 feet. If it be so, a progressive system of wells, with dépôts, might be carried, with certainty and safety to the party employed, across every intervening desert. Twenty-four wells, about fifty miles from each other, would establish a practicable route (the whole way, if the country be surface-desert) from the south-western extremity of Lake Torrens to Stokes and Gregory Victoria.

The deserts of Australia abound with wood-fuel, and if the water were sometimes salt, boilers and condensers, light enough for bullock drays, might avert the evil.

I have no doubt whatever but that, in the worst of circumstances, Australia may be safely and surely traversed by patient ingenuity; and I would say that the honour of England (if there were no other motive) requires that it should be done.

The PRESIDENT.—With reference to the observations which have fallen from Colonel Gawler, I can, at this late hour, only say that I have come to another conclusion concerning the condition of Central Australia. But, whilst my own views are printed in the last Anniversary Address, I shall willingly stand corrected if his theory, founded upon a personal acquaintance with the country, should prove correct, and that our colonists should be enabled to travel across the interior of that great continent, which is generally considered to be an impassable saline desert.

The third Paper read was :—

3. *Notes from the Mission to Central Africa.*

Communicated by the Earl of CLARENDON, F.R.G.S., H.M. Secretary for Foreign Affairs.

DR. VOGEL, who had arrived at Kuka after an absence of ten months and twelve days, wrote as follows on the 4th of December, 1855 :—

“I am not able to give now a detailed account of what I have seen and done, as arranging my papers, reducing my observations, and making a map, will take at least three weeks more time, but I will describe to you, as well as I can, the road I have taken.*

“On the 20th January I left Kuka for the town of Yacóba, accompanied by Corporal Macguire and four servants. On the road I had to pass through the capital of the large province of Gombé, situated on a large tributary of the Chadda, called

* For astronomical observations upon this route, see the first volume of ‘The Proceedings of the Royal Geographical Society.’ The observations of Dr. Vogel’s route from Kuka, south to Tubori, have not reached this Society for calculation.
—ED.

Gongola, which has its source in a mountainous district 40 miles south-west of Yacóba, and runs from the W.S.W. towards E.N.E., and therefore in the opposite direction, but parallel to the Chadda, and in the same direction with the Yeou, from which river it is separated by a low plateau, about 300 feet high and 40 miles broad. Fifteen miles W.S.W. of a small Bornu town called Gabbei, in about $11^{\circ} 40'$ North latitude, and $11^{\circ} 20'$ East longitude, the Gongola makes a sudden bend towards the South, and after a course of about 100 miles more empties itself into the Chadda. In Gombé I was received very kindly by the Sultan. Thence I reached in four days Yacóba, on ascending a large granite plateau of about 2500 feet elevation, densely populated by heathen tribes, most of them entirely naked, and wearing pieces of wood of from one to two inches in diameter in their perforated upper and under lips. Two hours after my arrival in Bautshi, I was informed by the governor that I had to leave the place immediately, as he suspected me to be a spy of the Bohari, a marauding Felatah tribe, residing in the neighbourhood of Katagum, and, I am sorry to say, aided and protected by the Sultan of Bornu; the Sultan of Bautshi having been already during seven years absent at a place three days N.N.W. from the capital, waging war with a neighbouring Kerdie tribe, the Sonoma. I had some trouble in getting permission from the governor of the town for Corporal Macguire and my servants to remain, in order to make the necessary preparations for my projected journey to Adamawa. I myself left on the second day for the camp of the Sultan Sanyanni Bautshi, accompanied by only one servant. The Sultan received me very kindly, and kept me at his place for forty days, during which time I nearly fell a victim to the climate. After having suffered from dysentery for thirty-five days, I thought that change of air would be the only means of saving my life, and the Sultan not giving permission for my departure, I was obliged to leave his place secretly, being so weak that my people were obliged to lash me to the saddle. Arrived in Yacóba, I found all preparations for a farther journey made, but at the same time, to my regret, Macguire so ill, that it became necessary to move immediately for a more healthy district. We both rallied in a few days after leaving Yacóba, which is dreaded on account of its excessive unhealthiness. This circumstance is the more surprising, as Yacóba is situated on a high dry plateau, thickly studded with granitic mountains of the most extraordinary shape. On the last of April we crossed the Chadda, exactly at the spot which the steamer Pleiad had reached; numerous empty pickle and brandy bottles giving sure evidence that Englishmen had been there. We

found the Sultan of Hamarua in a small village, Tindang, a day south from the river, and to my regret, at war with the heathen tribe of Bashama, through whose country is the only road practicable for horses to Adamawa. The Sultan told me that Mohamet el Amwel from Yola had, in vain, attempted to open a communication with him, as a body of Bornu horsemen had joined the enemy. I must observe that all the numerous bands of robbers which infest Southern Sudan are openly protected and aided by the Sheik 'Amur' of Bornu, who takes a tribute from them, amounting to thirty slaves for every successful marauding expedition. After having waited nearly a month at Tindang for the opening of the road, I was reluctantly obliged to give up my attempted journey to Adamawa, but not until I was assured that this state of things would last at least six months longer; the Sultan of Yola having been beaten back with great loss; and not until a small Sokatu caravan which had tried to open the road was destroyed only half a day's distance from Tindang. On retracing my steps, I took a new route *direct* to Gombé through the countries of the cannibal tribes Yemyem and Tangale, very seldom even visited by the inhabitants of the surrounding country. The country is very mountainous, and the travelling exceedingly difficult. The Tangale inhabit a high chain of mountains on the banks of the Chadda, with a fine peak very much resembling Adam-peak in the island of Ceylon. In the middle of June I arrived at Gombé, having lost nearly all my luggage-animals; and after having sold part of the remainder of my merchandise, I proceeded on an expedition to Salia, being obliged to leave Macguire behind in Gombé with the rest of my property and to take care of the few remaining horses. During his stay of two months and a half, he experienced the greatest hospitality and kindness as well from the Sultan as from the inhabitants of the place. My journey to Salia, during the height of the rainy season, without tent and scarcely any luggage, was very difficult on account of the inundated state of the low country, and the lofty chains of mountains I had to cross. I regret that in crossing a small river I lost the numerous plants I had collected, also my thermometers, boiling water apparatus, and the better part of my merchandise. Two days from Bautshi I had to cross the Yeou at its source, and three days from Salia two little rivers flowing west, and emptying themselves into the Niger. I reached Salia towards the end of July, and was very well received by the governor, in the absence of the Sultan. This town is the largest in the interior of Africa, about 10 miles in circumference, with a ditch and an excellent wall about 15 feet high. The inhabitants do not

exceed 30,000, the great part of the space inside the wall being occupied by fields. The town bears three different names, Segseg, Salia, and Sansan; the *first* after the heathen tribe from which it was taken about the year 1807, by the Felatah of Rashna; the *second* is the new Felatah name; and the *third*, the name by which the town is known in Bautshi, and at the same time that of the whole province. The country between Bautshi and Salia is entirely inhabited by heathen tribes, mostly without any dress, ornamenting themselves with a bit of rice-straw in the upper lip. Their villages being on the top of the steepest rocks, the Sultan adopted the following plan of catching slaves: he occupied with an imposing force the fields in the valley, driving all his horses in the then green harvest, until the poor fellows on the mountains surrendered for fear of starvation, and sent down the number of boys requested of them. The Sultan thus obtained in three weeks 200 fine slaves, who were marched off immediately to Sokatu for sale.* Towards the beginning of August I proceeded from Salia to Bebetgi, one day's distance from Kano, which place I did not visit on account of the cholera being very bad there, and the Sultan having just died. From Bebetgi I returned to Bautshi by a different road through the country of independent heathen tribes, and then, following a very kind invitation from the Sultan, I proceeded once more to Tindang. After a stay of a few days there, I received an acknowledgment of the presents made by me on my first visit, *i. e.*, of 10,000 shells, or about 40 dollars, and a very fine dress; and furnished again with money, I planned a new expedition to the Chadda by a new route. Being no longer in want of the dépôt in Gombé, and the remainder of my baggage-animals having recovered, I gave orders to Macguire to return to Kuka with all my servants but one.

"On the 21st of September I left Yacóba once more in a southerly direction, moving upon the town of Ukali. The road being entirely impracticable for baggage animals, I could only take as much luggage as my servant could carry on his head, consisting of a lion's skin to lie on, a blanket, a few shillings' worth of beads, and 10,000 shells. I lived for eight days entirely upon flour and water, being unable to procure anything else in the small villages on the steep and high chain of mountains along which we went. Three days from the Chadda the mountains cease, and the country, at this season of the year one sheet of water, is covered with grass 20 feet high, through which we had to cut a road, so that my

* "That Clapperton and Lander had visited the place, I heard from some of the oldest inhabitants.

progress in one day scarcely exceeded 5 miles. Arrived on the bank of the river, I was obliged to leave my horse behind; and after paddling about for three days in a miserable canoe, I arrived at last at the Rona town of Chubbún, where the Pleiad steamer had made a stop of a few days. I regret to say that I was unable to reach Ukali, only 15 miles farther inland, on account of the inundated state of the country. After stopping for some days at the aforesaid town, I went into the swamps of the river, living among the Rona in their miserable straw huts, in search of a curious fish, the *ajuh*, of which innumerable fables are told throughout the whole of Sudan. I found it to be a whale* about 10 feet long; living entirely on grass, and leaving the river when the water falls. I suffered very much from exposure to the wet and from bad victuals; nothing to be had but Indian meal and now and then a little hippopotamus and *ajuh* meat (the latter very rich). Enclosed is an accurate description of the *ajuh*, in German, to be translated by some zoologist in England, as I am not acquainted with the technical terms of English zoology.†

“At the end of October I returned to Bautshi, having lost my horse on the road. On my return to Gombé the Sultan presented me with a very fine animal, on which I reached Kuka on the 1st of December. I found Macguire and all my servants well; but it may give an idea of the difficulty of the roads I have travelled, that I lost no less than seven horses in the short space of ten months and twelve days. As soon as my papers and observations are sufficiently arranged, I will send them, and I hope that a caravan of the Ulad Solyman will start in about a month's time. As soon as possible I will start for Fittre, and proceed, if possible, as far as Wara. Should I, on my return in the beginning of May, find no letters or merchandise from Murzuk, and should I be unable to hear any news of the starting of a caravan, I will proceed for the west coast, if possible by way of Adamawa, and hope, with God's help, to reappear in the beginning of 1857, either at the mouth of the Cameroon or by way of Zalia on the Ebo, where I hope to find an English vessel to convey me to Fernando Po. But in case I should receive some supplies in the course of next year of merchandise, not exceeding 300 to 400 dollars in value, I will be able to follow up Dr. Barth's operations in Bagirmi, and in October 1856 start for Adamawa and the W. coast. If not, I will leave this in May, after my return from Wadai. I have *no wish* to leave the

* A manatee.—Ed.

† See Report of the British Association, 1856, p. 98.—Ed.

interior so soon, and will do so only on being assured that I cannot rely on any farther supplies.

"I beg to recommend to your special notice my faithful companion Corporal Macguire of the Royal Sappers and Miners, who has, notwithstanding the serious illness under which he suffered in the beginning of our journey, used every exertion to promote the object of the expedition, and behaved in the most praiseworthy manner.

"EDWARD VOGEL."

Extract of a Note from Consul G. F. Herman, Tripoli, to the Earl of Clarendon.

"MY LORD,—I have the honour to report to your Lordship the arrival here on the 14th instant of Mr. F. Warrington from Murzuk. His successor, Mr. Gaetano de Fremaux, after a long and arduous journey, reached that place on the 8th of February, and immediately assumed charge of the Vice-Consulate.

"I have farther the honour to transmit to your Lordship a copy of a despatch from Dr. Vogel, dated Kuka, 4th December last, accompanied by a description of a fish that he had discovered in the waters of the Chadda, and which he requests may be sent to some zoologist in England who understands German.

"As Dr. Vogel states to me that he had in his possession nearly 1000 dollars in money—as merchandise to the amount of 190*l.* and 100 dollars in money were forwarded to him by the last caravan that left Murzuk—and as another will not leave that place for Bornu before the end of July, if even then, I have instructed Mr. de Fremaux to retain until farther orders the 1000 dollars, which in my despatch separate No. 4, of the 8th instant, I reported to your Lordship had been remitted to Murzuk for the use of the mission; for should this money reach Kuka, as it certainly will, *after* the Doctor's movement to the southward, it would be utterly impossible to send it after him. If on the other hand the Doctor, by unforeseen circumstances, should be detained in Bornu longer than he contemplated, the money can be sent forward to Kuka. In the mean time he will have ample funds and merchandise for his present wants."

The PRESIDENT.—We are exceedingly indebted upon this, as upon many other occasions, to the Earl of Clarendon, who, as a member of this Society, loses no opportunity of communicating to us all documents relating to geographical discovery. I may, indeed, mention that I had recently the honour of waiting upon Lord Clarendon, as one of a deputation from the British Association for the Advancement of Science, with reference to the exploration of the Zambesi, when his Lordship assured us that he, on the part of the Government, was warmly disposed to offer every assistance to our enterprising and meritorious associate, Dr. Livingstone, in all his future researches; that he hoped through his agency to establish an important commerce with the natives; and that he looked upon our intercourse with the African as a subject of the greatest importance, as likely to procure for us a supply of cotton and other articles essential to the manufactures of Britain.

On a future occasion we shall have to consider a valuable memoir giving the details of Captain Burton's voyage down the east coast of Africa to the point from which he has started to pursue his adventurous journey into the interior, in which he will endeavour to determine the great question of whether there are really any lofty snow-covered mountains from whence it has been supposed the Nile may flow; or whether, as Dr. Livingstone's researches into the origin of other great African streams would suggest, the Nile does not take its source in one of the great interior lakes of that continent.